DRAFT

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EPA REGION 6 WATER MANAGEMENT DIVISION'S
STRATEGY FOR WET WEATHER SANITARY SEWER OVERFLOWS

I. **INTRODUCTION.** Many municipalities in Region 6 are experiencing overflows in their wastewater collection systems which are compounding the major urban pollution problems that cities are experiencing from nonpoint sources of runoff entering streams and rivers. Many municipalities are not aware of their obligations regarding sanitary sewer overflows (SSOs), especially during wet weather conditions. SSOs of untreated or partially treated wastewater from collection systems which may reach waters of the U.S. are violations of Section 301 of the Clean Water Act (CWA) and the provisions of NPDES permits, and therefore subject to enforcement actions. In addition, federal regulations [40 CFR Part 122.41(1)(6)] require that all such discharges which may endanger health or the environment must be reported to EPA.

The Region's approach to addressing SSOs is to require permittees to develop and implement an SSO corrective action program which will result in locating and eliminating overflows in the shortest possible time period. Each permittee is responsible for aggressively pursuing solutions for both the technical and fiscal problems which may arise during the implementation of a corrective action program, and EPA expects permittees to utilize state-of-the-art methods and expertise in evaluating their system.

II. **PURPOSE OF STRATEGY**. The intent of this Region 6 strategy/guidance is to inform and provide direction. Agency decisions in any particular case will be made by applying the law and regulations on the basis of specific facts. The purpose of the strategy is also to establish a standard for both the regulated communities, EPA Region 6 and State regulatory agencies in addressing wet weather SSOs. This strategy recognizes the site specific nature of SSOs and provides flexibility for local situations and consistency for enforcing the existing requirements of the law.

III. **SUMMARY OF STRATEGY.** The majority of overflows that occur in the collection systems are due primarily to wet weather inflow/infiltration combined with hydraulic restrictions such as insufficient line capacity and line blockages due to poor maintenance. Those permittees experiencing only dry weather overflows must develop and implement a preventative maintenance program which prevents dry weather overflows. However, Permittees with wet weather overflows problems within the collection system

shall develop and implement a program which includes either the "presumption" approach or the "demonstration" approach (as discussed in this document) to address all existing and potential sources of overflows. Under the demonstration approach, a permittee may demonstrate that a selected control program is

adequate to locate and eliminate SSOs and achieve compliance with its NPDES permit and the CWA. The presumption approach affords permittees the option to show, through a system-wide evaluation, that rehabilitation of the collection system alone will not achieve compliance with the CWA and the NPDES permit. The Region may then allow the use of wet weather alternatives in addition to the rehabilitation program). These approaches incorporate the options and principles contained in the Agency's Combined Sewer Overflow (CSO) Control Policy (40 CFR 122), which are applicable to SSOs. If wet weather discharges are allowed, then the permittee must consider environmental justice and water quality impacts in the location of such discharges. Any SSO control program must provide long term adherence to technology based and water quality based requirements of the Clean Water Act.

IV. **STATEMENT OF PROBLEM.** There are many municipalities in the Region with separate sanitary sewerage systems which experience overflows of untreated wastewater from the sanitary sewers during and following periods of rainfall. Sanitary Sewer Systems are designed to collect and transport to the wastewater treatment facilities the municipal and industrial wastewaters from residences, commercial buildings, industrial plants, and institutions, together with minor or insignificant quantities of ground, storm and surface waters that inadvertently enter the system. Over the years, many of these systems have experienced major infrastructure deterioration due to inadequate preventative maintenance programs and insufficient planned system rehabilitation and replacement programs. These have resulted in deteriorated pipes, manholes, and pump stations that allow large volumes of rainwater and groundwater to enter the systems and overload the hydraulic capacity of the systems. Extraneous flows enter the sanitary sewers through holes or cracks in pipes and manhole walls, holes in manhole lids, cross connections to storm sewers, residential and commercial roof drains connected to sanitary sewers and other illegal connections on both private and public properties. In addition, the hydraulic capacity of many lines in municipal systems has been decreased due to such things as

bottlenecks in the system resulting from root intrusion into the lines, dropped pipe joints and foreign materials and debris deposited in the lines. These bottlenecks in many instances reduce the hydraulic capacity of the lines to the extent that the lines might contain capacity to transport the dry weather flows, but during and following rainfall events, there is inadequate capacity to retain the increased wet weather flows within the system. The combined problem of increased hydraulic load from the wet weather inflow and infiltration together with the decreased hydraulic capacity resulting from system bottlenecks have resulted in wet weather overflows of raw wastewater from the sanitary sewer systems. In many cases these overflows are occurring throughout residential neighborhoods, flowing across lawns, in the streets, along the curbs, in drainage ditches and leaving unsightly debris deposited along the way. In other instances the overloaded lines cause sewer backups into private property or render the lines unusable until flows recede. These overflows also compound urban pollution problems by contributing to other sources of storm water runoff. Overflows of the untreated sewage can result in localized property damage without discharging to surface waters. Sanitary Sewer Overflows (SSOs) consist of mixtures of domestic sewage, industrial and commercial wastewaters, and storm water runoff. SSOs often contain high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Uncontrolled SSOs can result in discharges of pathogens into residential areas, cause exceedances of water quality standards (WQS) and/or pose risks to human health, threaten aquatic life and its habitat, and impair the use and enjoyment of the Nation's waterways.

V. **SANITARY SEWER OVERFLOWS (SSOs) AND COMBINED SEWER OVERFLOWS (CSOs).** On April 19, 1994, the Agency published the National CSO Control Policy in the Federal Register. The policy contains the Agency's objectives, control plans and alternative approaches for addressing overflows from combined sewer systems but does not address EPA policies for dealing with sanitary sewer overflows. Because of similarities between SSOs and CSOs many of the objectives and control requirements contained in the national CSO policy are applicable to SSOs. However, because there are also major differences between SSOs and CSOs, the CSO policy does not address all issues which must be resolved for satisfactorily addressing SSOs and achieving compliance with the CWA. The following is a discussion of some differences between SSOs and CSOs.

A. **Sanitary Sewers:** Separate sanitary sewers are designed to convey the liquid and water-carried wastes from residences,

commercial buildings, industrial plants, and institutions together with minor quantities of ground water. The groundwater, which is not admitted intentionally, usually infiltrates the system through leaking joints. Sanitary sewers are designed to convey all of the wastewaters to a treatment facility and do not contain special outlets or diversion structures to allow overflows from the sanitary sewers. However, it is recognized that some sanitary sewer systems do contain overflow structures located near or at pump stations. These overflows ports are designed to allow overflows to occur only during unpreventable power outages or pump failures. Since sanitary sewers are designed to convey only wastewaters with insignificant amounts of groundwater, these sewers would be generally much smaller than a combined sewer serving the same size service area. Over the years, many cities' sanitary sewer lines have deteriorated with age, neglect and lack of proper preventative maintenance programs. Many systems now contain defective sewer joints, cracked lines and manholes, displaced manholes, missing manhole covers, etc., which during wet weather allow rainfall runoff to enter the sanitary sewers. The lines soon become overloaded and uncontrolled overflows occur throughout the system. Since sanitary sewers have no overflow structures designed into the systems, the overflows occur through manholes and defective lines often occurring throughout the system including residential neighborhoods and at other low points in the system. The surcharged lines also cause backups into homes. In contrast, surcharged combined sewer systems are designed to overflow at specific select points through designed outlets. Also, in comparison to a CSO, the SSO contains higher percentages of raw sewage and a lower percentage of storm water.

B. Combined Sewers: In a combined sewerage system, a single set of sewers collects both the sanitary sewage and the storm water runoff. Combined sewers are designed to carry the sanitary sewage and all of the storm water runoff including building drains, residential roof drains and street inlets, etc. The combined sewers are designed with flow diversion structures and overflow outlet structures located at selected points within the system. During dry weather, the combined sewer conveys the sanitary sewage to the wastewater treatment plant. During wet periods and storm events, the flow diversion structures intentionally divert flows to the built-in CSO overflow outlet structures which discharges directly to a receiving stream. The quantity of storm water the combined sewer is designed to convey is many times that of the sanitary sewage and thus the sanitary wastes represent only a small fraction of the total capacity. Thus, overflows from combined sewers contain very large volumes of storm water and much smaller volumes of sanitary sewage.

C. Summary of Major Differences:

SANITARY SEWERS	COMBINED SEWERS
Designed to covey only sanitary wastes	Designed to convey sanitary wastes and stormwater
No diversion and outlet structures in original design except to protect some pump stations from flooding	Designed with diversion and overflow outlet structures
During wet weather, designed to discharge wastewater to a treatment plant	During wet weather, designed to discharge a significant portion of combined flow to a waterway
During wet weather, systems may contain overflows at uncontrolled locations	During wet weather, overflows occur at controlled points
SSOs occur through manholes, broken lines, at pump stations, inside buildings, etc., discharging throughout the system	CSOs occur through overflow outlet structures discharging directly to receiving stream
Wet weather SSOs generally contain approximately 30% to 35% raw sewage	CSOs generally contain approximately 3% to 10% raw sewage

D. CONCLUSI0NS. There are many differences and similarities between SSOs and CSOs. The key differences are that: (1) sanitary sewers have no diversion and discharge structures designed into the system to release the excessive flows into receiving streams at controlled discharge locations; and, (2) the overflows in sanitary systems occur through manholes and defective lines releasing the flows indiscriminately throughout the system into residential areas, streets, drainage ditches, onto private property and at any other low point in the system. Because the sanitary systems were designed with no diversion and controlled discharge locations and, the resulting overflows occur indiscriminately throughout the system, there are no centralized discharge points designed into the system which would allow the application of technology-based and water quality-based requirements of the CWA to the SSO discharges. It is for this reason that it is not possible to apply the National CSO policy per se to SSOs. However, there are many similarities between the SSOs and CSOs and much of the objectives and principles of the CSO policy are applicable to SSOs. If the indiscriminate SSO

locations can be controlled such that the excessive flows causing the overflows can be either eliminated or reduced to a level that the flows are contained and diverted to select locations, then the SSOs become very much similar to the CSOs and a CSO type approach becomes a feasible option for dealing with SSOs. The intent of this strategy document is to develop this option so that as much of the CSO policy objectives and principles as are applicable can be utilized in an SSO strategy.

VI. DISCUSSION OF LEGAL ISSUES. The question of whether an SSO discharge is an unpermitted discharge under CWA Section 301(a) or a permit violation under CWA Section 402 depends on the wording of the POTW's permit. In the absence of specific permission for an SSO discharge, an SSO discharge is an unpermitted discharge. However, SSO discharges may result from other permit violations, such as general provisions requiring permittees to maintain the sewer system properly and to operate the system to minimize inflow and infiltration and maximize the amount of pollutants reaching the headworks for treatment. Thus, a POTW with SSOs would be in violation of its permit as well as the CWA 301(a) prohibition against unpermitted discharges. SSO discharges are also subject to reporting under the permit provisions requiring reporting of noncompliance with permit provisions. For example, reporting is required if the SSO discharge results from the permittee's failure to meet obligations under the permit to properly maintain and operate the sewer system. An SSO discharge could also be specifically identified as subject to monitoring and reporting requirements in the permit. In addition, there has been question of whether an SSO discharge needs to reach the waters of the U.S. in order to be subject to CWA requirements. For determining whether the SSO discharge constitutes an unpermitted discharge in violation of Section 301 of the CWA, a discharge must reach waters of the U.S. However, for purposes of determining whether the SSO discharge results from permit violations, no such findings need be made. To be an unpermitted discharge in violation of the CWA, the SSO discharge must reach surface waters, either directly or indirectly through groundwater hydrologically connected to surface waters. If, however, the SSO discharge results from permit violations, e.g., a permit provision requiring proper operation and maintenance of the sewer system, then there is no need to establish a connection between the discharge and waters of the U.S. Some have questioned whether a SSO is an illegal bypass. In the 1989 National Combined Sewer Overflow Control Policy, EPA interprets the bypass provisions under 40 CFR 122.41 to apply only to those flows which reach the headworks of the treatment facility, but do not receive full treatment. Flows which discharge prior to reaching the headworks are not bypasses and cannot be authorized under the bypass provisions in EPA's regulations. Rather, such discharges must be

authorized separately by an NPDES permit. Because SSOs, like CSOs, never reach the headworks, the analysis would be the same for SSOs. In addition, SSOs, unlike CSOs, may be unintentional. Diversions must be intentional, however, to meet the definition of bypass in the regulations to see 40 CFR 122.41(m)]. Finally, there is the issue of what treatment standards are applicable to SSOs; i.e., whether SSOs are subject to secondary treatment or the technology-based standards applicable to non- POTW discharges. The statute does not clearly specify whether SSOs discharges are subject to secondary treatment or BAT/BCT requirements. Secondary treatment applies to discharges from POTWs. EPA has defined POTW to include "pipes, sewers, or other conveyances only if they convey wastewater to a POTW providing treatment." 40 CFR 122.2. In the CSO context, EPA has interpreted this definition to provide that secondary treatment requirements are only applicable to discharges from the POTW, not discharges from CSO outfalls that occur prior to reaching the headworks. This interpretation was upheld in 1980. Montgomery Environmental Coalition v. Costle, 646 F.2d 568, 592 (D.C. Cir. 1980).

VII. DISCUSSION OF SSO CONTROL PLAN.

A. Dry Weather Overflows. Dry weather overflows from sanitary sewers result from bottlenecks in the sewer system caused by insufficient routine maintenance, lack of adequate preventive line and/or pump station maintenance, system failures in lines or pump stations and line stoppages due to vandalism. SSOs resulting from any of these causes are a violation of the CWA and permittees are responsible for the discharges. While it may not be possible to preclude all SSOs resulting from acts of vandalism or unavoidable system failures, permittees are expected to prevent all other dry weather SSOs. Permittees with only dry weather overflows from separate sanitary sewer systems are required to develop and implement a preventative maintenance program which prevents these types of dry weather overflows.

B. Wet Weather Overflows. Permittees with wet weather overflows from separate sanitary sewer systems are required to develop a program that provides adherence to the technology based and water quality based requirements of the Clean Water Act.

C. Implementation of Minimum Controls. All permittees with

SSOs are responsible for developing and implementing an SSO program that will ultimately achieve compliance with the requirements of its NPDES permit and the CWA. During the interim period while developing and implementing a program to eliminate SSOs and achieve compliance with NPDES permit, permittees should immediately undertake a program to accurately characterize their sewer systems, to demonstrate implementation of nine minimum controls analogous to those in EPA's CSO policy, and to develop a control plan to eliminate SSos.

Permittees should prepare appropriate documentation demonstrating implementation of the aforementioned nine minimum controls, including proposed schedules for completing construction activities associated with the 9 minimum controls. The nine minimum controls for SSOs are:

1. Proper operation and regular maintenance programs for the sewer system and the SSOs;

2. Maximum use of the collection system for storage;

3. Review and modification of pretreatment requirements to assure SSOs impacts are minimized;

4. Maximization of flow to the POTW for treatment;

5. Prohibition of SSOs during dry weather;

6. Control of solids and floatable materials in SSOs;

7. Pollution prevention;

8. Public notification to ensure that the public receives adequate notification of SsO occurrences and SSO impacts; and,

9. Monitoring to effectively characterize SSO impacts and the efficacy of SSO controls.

Selection and implementation of actual control measures should be based on site-specific considerations including the specific SSO characteristics discussed under the sewer system characterization and monitoring portions of this Strategy. Documentation of the nine minimum controls may include operation and maintenance plans, revised sewer use ordinances for industrial users, sewer system inspection reports, pollution prevention programs, public notification plans, and facility plans for maximizing the capacities of the existing collection, storage and treatment systems, as well as contracts and schedules for minor construction

programs for improving the existing system's operation. The permittee should also submit any information or data on the degree to which the nine minimum controls achieve compliance with elimination of SSOs. These data and information should include results made available through monitoring and modeling activities done in conjunction with the development of the SSO control program described in this Strategy. This documentation should be prepared as soon as possible.

D. Control Program. Permittees with SSOs are responsible for developing and implementing an SSO program that will ultimately result in compliance with the requirements of its NPDES permit and the CWA. The program should consider the site-specific nature of SSOs and evaluate the cost effectiveness of a range of options. The development of the SSO program and its subsequent implementation should also be coordinated with the EPA Region 6 as well as State regulatory agencies. Permittees should develop and submit the SSO program as soon as possible. Once the dates for completion of the program are agreed upon, these dates will be included in an appropriate enforceable mechanism. The Plan should include fixed-date project implementation schedules. The elements of the SSO program plan are described below.

1. Characterization Monitoring. and Modeling of the Sanitary System

   In order to determine the extent of SSOs within the collection system, a permittee must have a thorough understanding of the capacity of the sanitary sewer system, the response of the system to various rain events, the characteristics of the overflow events, the extent of inadequate capacity in the system for handling wet weather flows, etc. The permittee must develop adequate flow monitoring data through installation of continuous flow monitoring stations throughout the system. The flow monitoring stations should be located in such a manner that the data collected will indicate where and to what extent problems exist and may be either temporary, permanent, or a combination of both. Without adequate flow monitoring of various storm events, it is almost impossible to determine the peak inflow rates. Also, the existing system capacity must be compared with projected peak flows from various storm events to evaluate the need for relief sewers and other modifications necessary to assure the system will not overflow. The continuous flow monitoring of the collection system along with the rainfall monitoring will enable the permittee to identify sub-basins with

inflow/infiltration (I/I) problems and capacity deficiencies and to prioritize sub-basins for the further field study. Computer modeling can be an effective tool in evaluating the capacity and the response of a sewer system to storm events of varying frequency and duration. The modeling of the sewer system may include hydrologic/hydraulic models utilizing both steady state and dynamic computer simulations of flow through the sewer network and computing hydraulic grade lines for storm events of varying frequency and duration. This may be accomplished by computer analysis of the flow monitoring data gathered during storm events and extrapolating flows for the range of anticipated storm events.

2. Control Options

After completing the characterization, monitoring and modeling of its sanitary sewer system, the permittee may undertake either a demonstration approach or the presumption approach to address the SSOs and achieve compliance with its NPDES permit and the CWA. Elimination of SSOs is typically addressed by a three (3) phase corrective action program which may be undertaken informally, or may be required by an order from the enforcement control authority. Phase I is diagnostic evaluation of the collection system to access the nature and extent of the overflows including integrity and capacity of the system. This phase includes the planning and implementation of all field work and other activities necessary to fully evaluate the system and develop a proposed rehabilitation and/or replacement program. Phase II consists of implementation of the remedial action program via design and construction of the facilities necessary to contain the wet weather flows within the system. Phase III incorporates the concepts of pollution prevention, preventative maintenance and planned rehabilitation and replacement to prevent infrastructure deterioration and maintain the quality of the system achieved through the Phase I and II programs. Historically, many municipalities with SSOs implemented Phase II without undertaking the diagnostic study of Phase I. The constructed improvements usually addressed obvious SSOs and created new SSOs downstream or compounded existing unknown SSO problems. The results were capital investments in improvements by municipalities resulting in continued sanitary sewer overflows and unsatisfactory program results. However, there are municipalities which have maintained effective

preventative maintenance programs and expanded its system to provide additional reserve capacity to meet its municipal and industrial needs. Some of these municipalities might have very infrequent wet weather overflows from its system. These permittees might choose the demonstration approach.

a. Demonstration Approach

The demonstration approach is applicable for permittees with minor and very infrequent overflows, which can demonstrate that data from the monitoring and modeling of its sanitary sewerage system together with its long term maintenance records has enabled the permittee to: (1) locate all of the system overflows and; (2) to design and construct system improvements which will eliminate the SSO and transport all flows to the POTW for treatment. The permittee should provide the Region a schedule including milestone dates for design and construction of the system improvements. The construction activities must eliminate all SSOs and transport all flows to the POTW for treatment. Wet weather interim storage facilities for storage of peak wet weather flows and pump back for treatment might be constructed as part of the POTW. The schedule for the design and construction activities must include, at a minimum, dates for:

(1) Initiate design;

(2) Complete design;

(3) Initiate construction;

(4) Complete construction; and,

(5) Achieve compliance with the permit/CWA.

b. Presumption Approach

Permittees should implement the presumption approach in systems where:

- The flow monitoring and modeling of the system provides inadequate data to locate all SSOs and, design and construct improvements to eliminate all SSOs; or,

- Rehabilitation of the existing system to eliminate I/I and construction of adequate relief lines to transport all flows to the POTW for treatment might not be technically or financially achievable by the permittee; or,

- System rehabilitation plus construction of wet weather discharge facilities (WWF) might be necessary to eliminate SSOs in the collection system.

Municipalities with these wet weather SSO problems are expected to initiate a comprehensive program to evaluate the condition of the sanitary sewer system, locate the SSOs and sources of the I/I, determine the method of system rehabilitation and improvement and develop a design and construction program which will achieve compliance with the CWA and the permittees NPDES permit. The elimination of SSOs should be addressed by the three (3) phase program described in the following sections. It is anticipated that the collection and analysis of data in Phase I will be a continuing process, so that the resulting report and plan of action will adequately address all problems and reflect the evolving nature of the problems encountered. The final construction project may include activities or items such as repair, replacement or relining of existing sewer lines, the construction of relief lines, upgrading or constructing lift stations, increasing treatment plant capacity and the construction of surge/flow equalization facilities necessary to eliminate the wet weather overflows.

In developing an SSO program the permittee should utilize the following guiding principles;

GUIDING PRINCIPLES

1. Implement a thorough sanitary sewer evaluation survey with special emphasis on locating all inflow sources including rainfall induced infiltration (RII).

2. Rehabilitate the system and eliminate all inflow and RII sources located during the study which are on public lines. (Including public and private roof drains, yard drains and other stormwater connections);

3. Rehabilitate additional areas as necessary to restore system structural integrity;

4. Provide system capacity to maximize delivery of remaining wet weather flows to POTW for treatment;

5. Initially eliminate all overflows from high public use and public access areas;

6. In the unusual case that a wet weather facility is needed, it should discharge at a specific location under controlled conditions, and directly into a receiving stream;

7. Provide water quality sampling and receiving stream modeling in accordance with the Region's guidance to demonstrate no adverse water quality impacts form proposed wet weather facility discharges;

8. Provide long term wet weather monitoring of receiving stream and wet weather facility discharges in accordance with the Region's guidance.

PHASE I

Recommended field activities of the first phase of the program include, but may not be limited to, the items discussed below:

A. Characterization, Monitoring and Modeling of the Sanitary System.

This field activity would not be necessary if it was completed prior to the decision to implement the "presumption" approach. Otherwise, it would be completed as previously described.

B. Physical Inspection

A physical inspection of the wastewater collection system will isolate obvious problem areas and establish a complete inventory of the collection system, update existing maps and record systems defects. Many overflow sources occur at manholes due to defective, damaged or deteriorated manholes, covers, rings, frame seals, etc. A thorough physical inspection of the system will locate many of the overflow problems and inflow sources with the collection system. Since manholes are often a significant source of inflow contributing to surcharge lines and sewer system overflows, an inspection of the manholes can often reduce subsequent expensive field tasks. Field crews should thus perform visual manhole and pipeline inspections and also correct and update maps of the collection system.

C. Smoke Testing

Smoke testing of the sanitary sewer system when properly done, is a relatively inexpensive method to locate sources of wet weather inflow to the system. Smoke machines with sufficient capacity to pressurize the system will locate roof drains cross-connected to the sanitary sewers, identify storm sewer connections and other sources of inflow through broken, defective, misaligned, etc, pipes and manholes. Given the relative ease and low cost of proper smoke testing, permittees should consider testing the entire collection system.

D. Flow Isolation

Flow isolation is the instantaneous measurement of flows at key manholes during the early morning hours between midnight and 6:00 a.m. to determine the infiltration rates. Evaluation of the data from the continuous flow monitoring phase of the study will identify areas subject to infiltration of the magnitude which would warrant flow isolation field work. Correlation of flow isolation data with the continuous flow monitoring data will enable the permittee to pinpoint the line segments (manhole to manhole) subject to excessive groundwater infiltration. These line segments should then be evaluated for cleaning and televising in order to determine the sources of infiltration and to establish the method of repair.

E. Dyed Water Testing

Dyed water testing is used primarily to locate and/or quantify inflow sources identified during smoke testing. It is typically performed on suspected cross connections between storm sewers and the sanitary sewers and on sections of storm ditches which either cross, or, are parallel to the sanitary

sewer. Also, suspected inflow sources such as area drains can be dye tested to verify cross connections to the sanitary sewers.

F. Cleaning and Televising

Cleaning and televising of the sanitary sewers is used to:

(1) determine the structural condition of line segments;
(2) determine the method of rehabilitation of line segments;
(3) verify exact locations of cross connections to storm sewers or other illegal connections to the sanitary sewers;
(4) verify joint conditions, etc.; and,
(5) determine exact locations of inflow sources.

During smoke testing, the smoke may surface at some point laterally removed from the actual defect in the sewer line. By flooding the surface smoke point while televising the sewer line, the exact location of the inflow source can be determined on the sewer line. Cleaning and televising of the sanitary sewers is usually the most expensive survey field task per linear foot. It is also, one of the more valuable task performed during the analysis of the system.

G. Evaluation, Final Report and Schedule Submittal

Upon completion of field activities, the permittee shall complete engineering and financial evaluations, and a Phase I final report. Financial evaluation of the overall program should include implementing the appropriate wastewater user rate structure to finance all required improvements. While the financial ability of the permittee to pay for the necessary improvements will vary with the economic condition of each municipality, the EPA considers sewer charges in the range of one percent (1%) to one and three-quarters percent (1.75%) of the median household income for the service area as a "rule of thumb" guide to affordability for all communities. This amount was established in the 1980's by EPA in determining affordability of communities for constructing wastewater treatment facilities. For more specific guidance on affordability, permittees should refer to EPA's Office of Water Program Operations' "Financial Capability Guidebook" dated March 1984.

In addition, the permittee shall prepare a schedule for the rehabilitation of the system, which will be submitted to EPA. In large systems where the permittees has divided the system into 2 to 3 areas for performing activities I. through VI .

above, the permittee will be performing different field activities concurrently in each of these areas or through system priority basis. As the final report and engineering evaluations are completed for an area, the design and construction schedule for the area must be provided to EPA within 60 days.

The schedule must include, at a minimum, dates for:

(1) Initiate design;
(2) Complete design;
(3) Initiate construction;
(4) Complete construction; and,
(5) Achieve compliance with the permit.

PHASE II

The permittee must initiate and complete the necessary design and construction. All work must be completed in a timely manner and in accordance with the schedule submitted as required by activity VII. above.

PHASE III

The Permittee shall develop a comprehensive monitoring program for the operation and maintenance (O&M) of the collection system after completion of construction. This O&M program shall provide for specific measures to be taken for the continuous maintenance of the system. Failure to properly maintain the system may lead to deterioration of the lines, lift stations, manholes, etc., allowing for possible I/I, hydraulic restrictions, power failures, etc., resulting in overflows.

In addition to routine activities, the program shall identify recordkeeping procedures to include logs and checklists of the different activities necessary to maintain the collection system.

WET WEATHER FACILITIES

A. Applicability

In many areas subject to intense rainfall, the flooding of streets and other areas may present a storm water handling situation, which creates complex technical and economical problems which must be considered when developing a program to eliminate sanitary sewer overflows. The cost of implementing a construction program to eliminate all I/I sources and SSOs located in the phase I study and transporting all remaining flows under all conditions to the

treatment facility, may be beyond the economic ability of some permittees. Thus, the concept for controlling SSOs is to:

(1) eliminate or minimize uncontrolled SSos from manholes, etc., in residential and other city areas;

(2) maximize I/I reduction and delivery of flows to the POTW;

(3 prevent overflows to environmentally sensitive areas;

(4) prevent any water quality standards violations; and,

(5) design sanitary sewer diversion structures and overflow outlet structures so that discharges occur at designated controlled overflow points.

This concept of:

(1) allowable wet weather facility discharges under specified conditions;
(2) controlled discharges at selected points;
(3) no overflows to environmentally sensitive areas; and,
(4) protection from water quality standard violations,

incorporates into the Region 6 SSO strategy the major concepts of EPA's national CSO policy.

The use of allowable overflows at controlled outlet structures under specified conditions and at controlled overflow locations would be considered only when the permittee's diagnostic system evaluation and economic feasibility analysis determines that rehabilitation and expansion of the collection system alone would not achieve the goal of no SSOs. In such cases, the Region would consider the use of wet weather facilities under specified conditions in addition to the system rehabilitation and expansion program.

B. Options

Each permittee considering wet weather facilities must provide a financial analysis demonstrating that:

(1) conveyance of all wet weather flows to the POTW after system rehabilitation is not economically achievable by the permittee;

(2) alternatives such as storage and pump back for secondary treatment; or,

(3) satellite POTWs is beyond the permittee's economic ability to pay; and,

(4) at minimum provide economic justification including the factors listed below for the cut-off point at which the flow will be diverted from the collection system to the WWF for discharge.

Permittees must also evaluate a reasonable range of alternatives including achieving zero discharge events per year. For purposes of this criterion, a discharge from a WWF is one or more discharges from a WWF as the result of a single precipitation event that requires discharge. Municipalities with SSOs are encouraged to work with the Region in developing a proposed overflow control program and schedule for implementing the program. The Region welcomes site specific programs tailored to the permittee's situation to include more cost effective means of solving the municipalities SSO problems.

C. Economic Considerations

The economic analysis of alternatives must be sufficient to make a reasonable assessment of cost. The permittees financial capability to construct the improvements should consider such factors as:

i. Median household income;

ii. Total annual wastewater and SSO control costs per household and as a percent of median household income;

iii. Overall net debt as a percent of full market property value;

iv. Property tax revenues as a percent of full market property value;

v. Property tax collection rate;

vi. Direct net debt per capita;

vii. Overall net debt per capita;

viii. Sewer fund operating ratio;

ix. Sewer fund coverage ratio;

x. Unemployment;

xi. Bond rating;

xii. Grant and loan availability;

xiii. Previous and current residential, commercial and industrial sewer user fees and rate structures; and,

xiv. Other viable funding mechanisms and sources of financing.

D. Permit

Any permittee proposing to construct wet weather discharge facilities must demonstrate from a water quality study that discharges from proposed wet weather facilities will meet water quality standard requirements.

If approval for WWFs is granted, the NPDES permit for the WWF will specify what monitoring, and effluent limitations and requirements apply to the discharge. At a minimum, permittees must provide in the initial construction phase facilities which will meet water quality standards requirements including removal of floatables and solids. The initial construction must also provide a phased approach capable of future expansion to provide a higher level of treatment if necessary to meet more stringent effluent requirements at a later date. The permit will also provide that approval for the discharge will be reviewed and may be modified or terminated if there is a substantial increase in the volume of character or pollutants being discharged, new information, or additional studies indicate water quality standards violations.

The facilities shall be maintained routinely to assure their proper operation. Mechanical/electrical components, if used, should be tested for proper performance at regular intervals. The permittee must also continue to evaluate the impact of discharges from any wet weather facilities and document that it will not cause a violation of in-stream water quality standards. The permit may be reopened to require additional treatment if water quality impacts are shown.